

**DATA ANNOUNCEMENT BULLETIN**

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STATUS OF AVAILABILITY OF  
MARINER 9 (1971-051A) TV PICTURE DATAINTRODUCTION

The purposes of this Data Announcement Bulletin are to describe the Mariner 9 TV data that are now available from the National Space Science Data Center (NSSDC) and to explain the procedures for ordering these data. Because NSSDC is receiving the Mariner 9 picture data on a continuing basis, descriptions of the TV data products and supporting documentation scheduled to become available through NSSDC in the future are also included. The descriptions of Mariner 9 TV data products and supporting documentation appear in the following order.

- . Mission Test Video System (MTVS) Pictures
- . Image Processing Laboratory/Reduced Data Records (IPL/RDR) Pictures
- . Indexes to Mariner 9 Pictures
- . Supplementary Experiment Data Records (SEDR)
- . Mosaics
- . Journal Articles
- . "Mariner Mars 1971 Television Picture Catalog," Volume I
- . "Mariner Mars 1971 Television Picture Catalog, Sequence Design and Picture Coverage", Volume II
- . MM71 MTC/MTVS Catalog on Microfiche
- . MM71 IPL/RDR Catalog on Microfiche
- . MM71 MTC/MTVS and IPL/RDR Catalogs on Microfilm

A summary of the status of Mariner 9 picture data and supporting data to be produced by the Jet Propulsion Laboratory (JPL) in Pasadena, California, and distributed by NSSDC is found on page 17 of this Announcement Bulletin.

BACKGROUND

Mariner 9 was launched on May 30, 1971, and went into orbit around Mars on November 14, 1971. At the time of Mars orbit insertion, there

(NASA IN X-69216) STATUS OF AVAILABILITY  
 OF MARINER 9 (1971-051A) TV PICTURE DATA  
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was a planet-wide dust storm that obscured the surface from view of the two (A and B) TV cameras. This dust storm caused the original mission of the TV experiment to be considerably altered. Mapping sequences were not begun until orbit 100, and instead of orbiting Mars at a periapsis of 1200 km, Mariner 9 orbited at a periapsis of 1600 km.

In April 1972 (orbit 262), the primary mission was completed. Picture taking sequences were suspended while the spacecraft was subjected to solar occultation (April until June 10, 1972). The extended mission was performed from June until October 27, 1972, when Mariner 9 was commanded off.

By the end of its mission, Mariner 9 had mapped 100% of Mars and had returned 7329 pictures of the Martian surface, the Martian satellites, Saturn, and star fields. These pictures were received from the spacecraft in digital form and were reconstructed and enhanced at JPL.

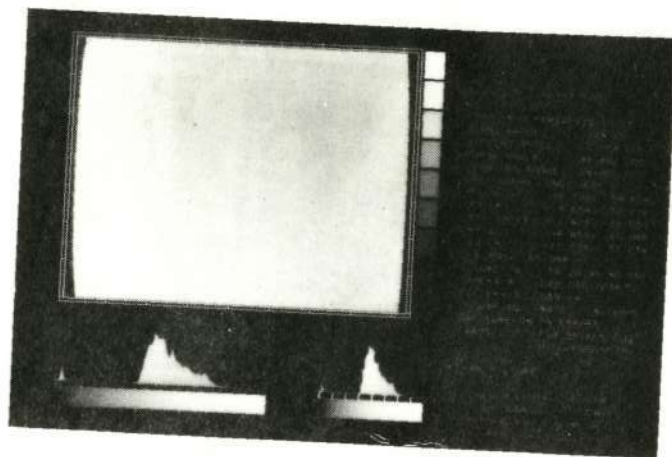
The responsibility of JPL to process the Mariner 9 picture data includes the production of raw images and the enhancement of raw pictures by the Mission Test Video System and the production of "decalibrated" pictures (reduced data records) and special enhancements by the Image Processing Laboratory. JPL is also responsible for producing the supporting data and documentation that are necessary for analysis of the Mariner 9 picture data.

#### MISSION TEST VIDEO SYSTEM (MTVS) PICTURES

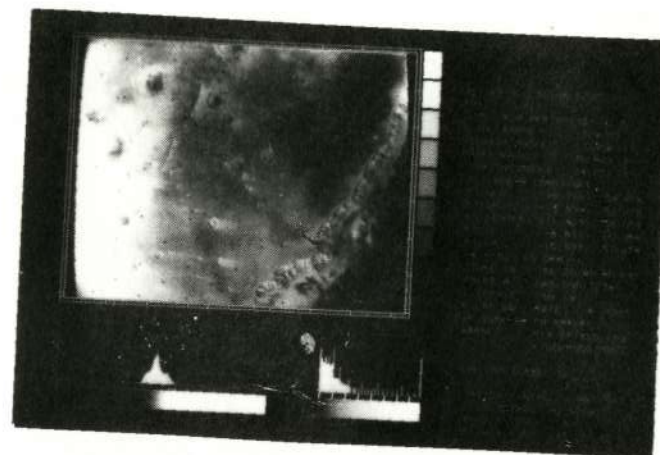
Four versions of Mariner 9 pictures were produced by the Mission Test Video System at JPL in a near real-time operating mode. These versions are labeled in the following manner.

- . Raw picture
- . Shading corrected
- . High-pass filtered
- . Vertical AGC (automatic gain control)

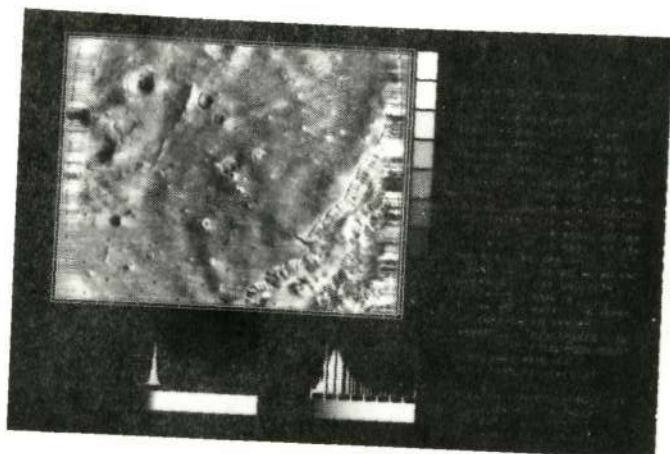
The raw and shading corrected versions have been produced for every image obtained by Mariner 9 after orbit insertion. The high-pass filtered version is available for revolutions up to 166, after which the vertical AGC version was produced. Both versions are available for many of the revolutions after 166. The vertical AGC and high-pass filtered versions of Mariner 9 TV data are similar to the maximum discrimination enhancement version of Mariner 6 and 7 picture data. Likewise, the shading corrected version of Mariner 9 TV data is similar to the albedo version of Mariner 6 and 7 TV data. The following descriptions of the imagery processed by the MTVS should aid the user in selecting the version best suited for his particular study. Figure 1 contains samples of each MTVS version for one DAS time (data automation subsystem reference time), DAS 09017234. The data block for this DAS time is explained in Figure 2.



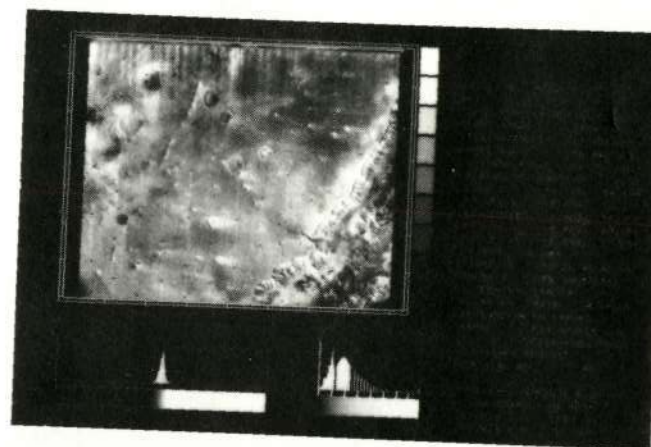
a. Raw Picture



b. Shading Corrected



c. High-Pass Filtered

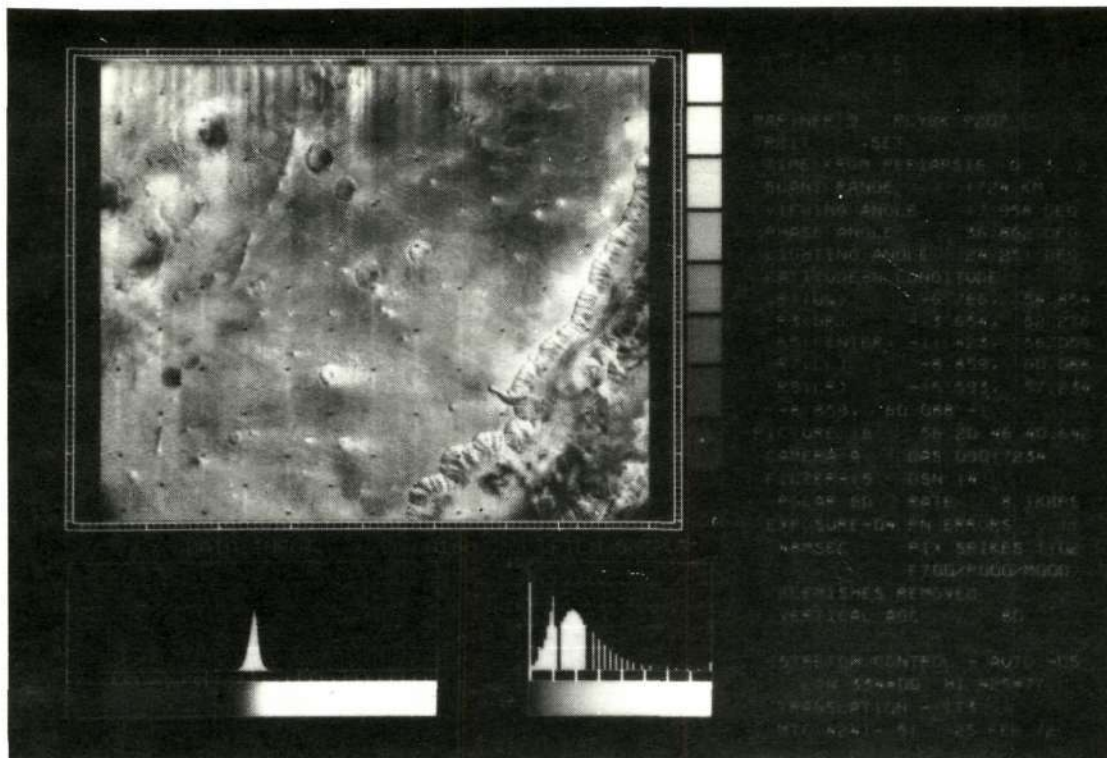


d. Vertical AGC

Figure 1. Sample Pictures of All MTVS Versions for DAS 09017234

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best available copy.





a. Enlargement of MTVS Vertical AGC Picture Version

MTC-MTVS	
MARINER 9 PLYBK P207	— orbit number during which picture was taken (orbit 207)
ORBIT .SET	
TIME FROM PERIAPSIS 0.3.2	— time at which picture was taken, relative to time of periapsis, hr-min-sec
SLANT RANGE 1724 KM	— distance from spacecraft to planet at center of picture, km
VIEWSING ANGLE 17.958 DEG	— view angle at center of picture
PHASE ANGLE 36.862 DEG	— phase angle at center of picture
LIGHTING ANGLE 24.251 DEG	— solar incidence zenith angle at center of picture
LATITUDE-W LONGITUDE	
R1(UL) -6.766, 54.854	— latitude and west longitude of upper left corner of picture
R3(UR) -13.654, 52.276	— " " " " " upper right " " "
R5(CENTER) -11.423, 56.059	— " " " " " center " " "
R7(LLL) -8.859, 60.088	— " " " " " lower left " " "
R9(LR) -15.593, 57.234	— " " " " " lower right " " "
-8.859, 60.088 -1	
PICTURE 16 56 20.46.40.642	— DAS picture count (not relevant); telemetry receipt time (day-hr-min-sec)
CAMERA A DAS 09017234	— camera identification (A = wide angle, B = telephoto); DAS time
FILTER-15 DSN 14	— color filter setting (not relevant after orbit 118); tracking station in use
POLAR 60 RATE 8.1KBPS	— telemetry bit rate in use at time of transmission (8.1 kilobits per second)
EXPOSURE-04 PN ERRORS 11	
48MSEC PIX SPIKES 1102	— camera shutter exposure time (48 msec); "pix spikes" is a noise level indicator
F700/P000/M000	— fully-reproduced scan lines = 700, partial lines = 0, missing lines = 0
BLEMISHES REMOVED	— certain nonrandom noises have been smoothed over
VERTICAL AGC 80	— processing version identification
STRETCH CONTROL - AUTO -CS	
LOW 334=00 HI 425=77	— various picture processing parameters
TRANSLATION - TT3	
MTC 4241- 51 25 FEB 72	— MTC/MTVS negative roll number and file number; processing date

b. Data Block Explanation

Figure 2. MTVS Picture Enlargement and Data Block Explanation for DAS 09017234

- . The raw pictures exhibit low contrast with little observable variation of brightness. Some surface features can be distinguished, but these renditions are of limited use for examining details or in making maps. However, these pictures are useful for evaluations of brightness of the atmosphere of Mars. Raw versions of the limb pictures are also useful for comparisons of obscuration experienced during the dust storm and after its recession.
- . The shading corrected version has had all data values representing brighter gray shades increased toward the white region and all values representing darker gray shades decreased toward black. Corrections for shading introduced by the spacecraft vidicon were performed, and noise elements were removed by a despiking process. A brightness correction function was applied to the value of each data word. The enhancement of the insolation variation across the picture usually caused saturation on one side of the image and darkness on the other. However, this version is useful in studies of relative contrast in surface features. This contrast version points toward albedo but is not used for true albedo determinations. Changes in contrast vs time are determined with this version when images of the same surface area, recorded during different revolutions, are compared.
- . The high-pass filtered version has had the variations in average brightness level reduced along each TV line by a high-pass filter. This allows for use of extreme contrast stretch to display maximum Martian surface detail without encountering a washout of high-brightness and low-brightness areas. This horizontal filtering is accomplished by subtracting the average value of the 125 elements per line on both sides of each picture element from the value of the element. This version distorts the albedo while discriminating fine detail.
- . The vertical AGC version has been subjected to filtering along the vertical sets of picture elements. The filtering correction for each element is performed by subtraction of the average value of the 80 picture elements preceding each picture element in the column. The running average is different from that used in the high-pass filtering process, hence AGC. The vertical filtering suppresses the strong vertical noise elements that occur in the data, whereas, the noise elements appear enhanced in the high-pass filtered version. The vertical AGC version is useful for studies of surface detail.

At this time (April 1973), NSSDC has received all of the MTVS picture versions. The MTVS pictures are available on 70-mm black and white roll film, and reproductions of individual frames can be obtained as positive or negative contact film transparencies, positive contact paper prints, or enlargements in various formats and sizes. The standard enlargement size is 8 by 10 inches. Requests for Mariner 9 MTVS picture reproductions are to include the DAS time, the roll and file number, and also the version of the picture desired. Latitudes and longitudes of desired pictures are also helpful in responding to requests.

#### IMAGE PROCESSING LABORATORY/REDUCED DATA RECORDS (IPL/RDR) PICTURES

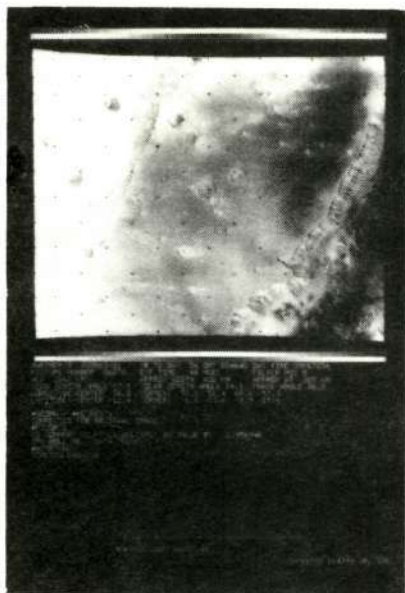
The Image Processing Laboratory at JPL is currently processing three enhanced versions of the Mariner 9 pictures derived from reduced data records. The versions are labeled

- . ASTRTCH (contrast enhanced)
- . FASTFIL (high-pass filtered)
- . R&S (rectified and scaled)

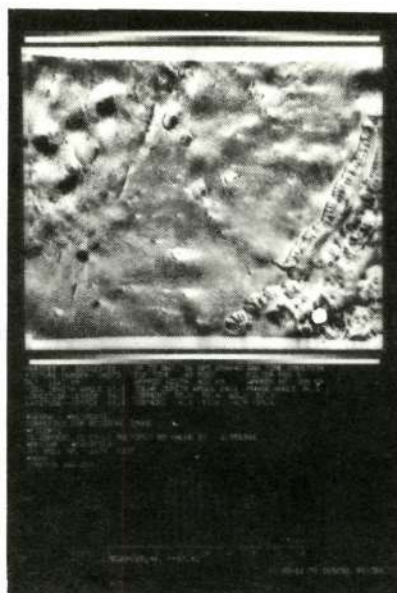
These enhancements are similar to those performed by the MTVS, but the IPL process is more refined. The residual image has been removed where possible, and all pictures have been corrected for geometric distortion. Figure 3 contains samples of each IPL enhancement for DAS 09017234.

- . The ASTRTCH (contrast enhanced) versions are similar to the MTVS shading corrected version. The contrast enhancement reveals surface detail and maintains relative surface brightness relationships. These pictures are used to analyze surface contrast characteristics of Mars.
- . The FASTFIL (high-pass filtered) version produced at IPL is filtered vertically in order to discriminate fine surface detail; however, relative brightness information is lost. This version is useful for geological studies.
- . The R&S (rectified and scaled) pictures are generally produced in the high-pass filtered version; however, some pictures are also produced in a contrast-stretched version, corrected for solar lighting angle. The R&S pictures have been geometrically projected by digital computers to map formats. *The R&S version will include only those pictures taken for mapping purposes and any other pictures found useful for mapping purposes.* Pictures taken in the

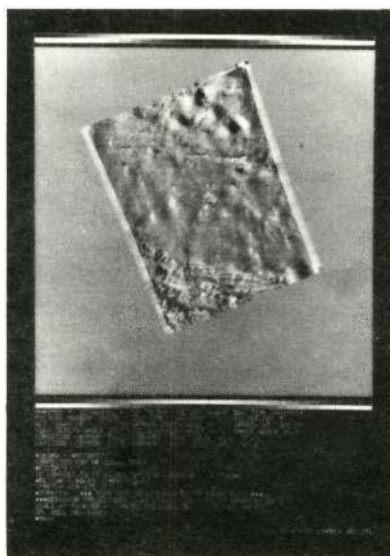




a. ASTRTCH (contrast enhanced)



b. FASTFIL (high-pass filtered)



c. R&S (rectified and scaled)



Figure 3. Sample Pictures of All IPL/RDR Versions for DAS 09017234

equatorial region ( $\pm 30^\circ$  latitude) will be in Mercator projection, pictures from  $\pm 30^\circ$  to  $\pm 65^\circ$  latitude will be placed in Lambert conformal projection, and polar region pictures will be in a polar stereographic projection.

The IPL/RDR pictures are being received on a continuous basis at NSSDC at this time. However, because of the nonsequential manner in which this large volume of pictures is being received, NSSDC cannot assure immediate response to requests at this time. The pictures will be available on 70-mm black and white roll film, and reproductions of individual frames will be produced as positive or negative contact film transparencies, positive contact paper prints, or enlargements in various formats and sizes. Requests for Mariner 9 IPL/RDR picture reproductions are to include the DAS time, roll and processing time, and version desired. The requester will receive an acknowledgment of the request and an approximate date for receiving the pictures. Requests will be filled as soon as the required pictures are received at NSSDC.

#### INDEXES TO MARINER 9 PICTURES

Indexes that contain identifying information for picture selection are available from NSSDC on 16-mm microfilm. These indexes are strongly recommended as an aid to the user in preparing requests for pictures.

There are six indexes (see Figure 4) each of which contains, for each Mariner 9 TV exposure, (a) latitude center point (and corner coordinates), (b) longitude center point (and corner coordinates), (c) a comment field (features in pictures), (d) MTVS roll and file numbers, (e) IPL roll and processing times, and (f) DAS time and revolution. Each of the six indexes is ordered by one of the categories listed above, thus enabling the user to select and supply NSSDC with the correct descriptive numbers when ordering pictures.

The indexes are grouped on two reels of microfilm in the following manner.

- . Latitude Center Point  
Longitude Center Point  
Comments
- . MTVS Roll and File Number  
DAS Time and Revolution  
IPL Roll and Processing Time

Clearly specify on the order form which reel is most suitable for your needs in selecting pictures to request from NSSDC.



LAT(S)	DAS-TIME	MTVS	IPL		LAT(X)	LON(X)	COMMENTS
	REV	ROLL-FILE	ROLL	PROCTIME			
-29.53	08621244	4230-031	1663	140044	-25.46	-31.67	294.53 291.71
	196	4230-032	1663	140406	-29.53	295.94	CRATERS ALBEDO AND BLACK PATCHES
		4230-033	6210	151613	-27.11	-33.66	A 44
-29.53	08657224	4231-010	1225	093110	-25.54	-31.94	110.01 107.70
	197	4231-011	1225	092217	-29.53	111.74	ALBEDO, BLACK SPLOTCHES, CRATERS
		4231-012	1664	133606	-26.82	-33.53	A 12
			1664	134242			
			6170	160353			
			6251	193005			

a. Mariner 9 Picture Index by Latitude Center Point

LON(S)	DAS-TIME REV	MTVS ROLL-FILE	IPL ROLL	PROCTIME	LAT(X)		LON(X)		COMMENTS
157.49	03426510	4062-001	0921	214700	27.13	24.97	157.18	165.66	NEARLY MISSED LIMB - PICTURE 95
	051	4062-002	0921	215011		31.50	157.49		PERCENT PLANET 01
		4062-003			38.05	38.37	147.15	155.30	
		4062-097							
		4062-098							
		4062-099							
157.49	08225884	4218-049	1218	131716	3.98	.32	160.33	152.52	DARK MARKINGS
	185	4218-050	1218	130852		-.69	157.49		A46
		4218-051	1652	193301	-1.83	-4.99	163.50	155.08	
			1652	193850					

b. Mariner 9 Picture Index by Longitude Center Point

COMMENTS	DAS-TIME REV	MTVS ROLL-FILE	ROLL	IPL PROCTIME	LAT(X)		LON(X)	
LIMB	A1 01748626	4012-004	0524	231116	-55.56	-67.23	24.89	17.13
	003	4012-005	0524	231140	-60.54		36.88	
		4012-006	0740	233200	-45.00	-61.52	57.08	63.43
LIMB	01 02995380	4049-001	2052	220813	14.51	7.27	186.69	206.73
	039	4049-002	2052	220239	13.29		196.21	
		4049-003			17.10	14.22	188.82	200.98
		4049-097						
		4049-098						
		4049-099						

c. Mariner 9 Picture Index by Comment

Figure 4. Sample Indexes for Mariner 9 Pictures

MTVS ROLL-FILE	DAS-TIME REV	LAT(X)		LON(X)		IPL ROLL PROCTIME		COMMENTS	
4142-001	05773393	-1.35	-2.02	281.67	280.42	0315	241120	PHOBOS	BC1
4142-002	117	-1.21		280.79		0315	241430		
4142-003		-.39	-1.10	281.13	279.91	0315	241319		
						0315	193627		
						1567	141040		
						1567	141649		
4142-004	05776508	-73.94	-68.06	117.53	249.36	0247	214520	MANY CRATERS ALBEDO DETAIL	A02
4142-005	117	-67.63		209.87		0354	164019		
4142-006		-59.61	-53.86	173.73	224.85	0354	163720		
						0356	201826		
						0356	202440		
						1146	112121		
						1146	111347		
						1453	100839		

d. Mariner 9 Picture Index by MTVS Roll and File Number

DAS-TIME REV	MTVS ROLL-FILE	IPL ROLL	PROCTIME	LAT(X)		LON(X)		COMMENTS	
05560768	4136-016	0265	195716	-35.34	-30.69	226.30	251.69	LIMB, SURFACE DETAIL	O A 10
111	4136-017	6220	174523	-23.46		236.16			
	4136-018			2.63	.85	212.11	242.67		
05561573	4136-019	1562	100852	-57.93	-58.89	222.34	224.67	CRATER DETAIL, ALBEDO PATCHES	BF10
111	4136-020	1562	100159	-57.95		224.18			
	4136-021	6409	112407	-57.01	-57.94	223.71	226.00		

e. Mariner 9 Picture Index by DAS Time and Revolution

IPL ROLL	PROCTIME	DAS-TIME REV	LAT(X)		LON(X)		MTVS ROLL FILE	COMMENTS	
0926	115910	03714525	-37.34	-19.07	107.39	150.63	4073-013	TWO VERY DARK CRATERS	V 26
0926	115422	059	-16.82		124.54		4073-014		
			-4.94	9.71	86.38	128.26	4073-015		
0926	122502	03717615	-57.17	-58.23	326.03	285.59	4073-031	SOUTH POLAR CAP--REMNANT DIMINISHING	O 36
0926	121802	059	-82.70		329.50		4073-032		
			-78.48	-84.96	41.33	165.22	4073-033		

f. Mariner 9 Picture Index by IPL Roll and Processing Time

Figure 4 (continued). Sample Indexes for Mariner 9 Pictures

## SUPPLEMENTARY EXPERIMENT DATA RECORDS (SEDR)

Supplementary Experiment Data Records, which are available on 16-mm black and white microfilm, will be routinely provided in response to all requests for picture data. The requester will receive the complete record on one 16-mm black and white microfilm reel.

The SEDR contains parameters such as latitude and longitude, solar illumination angle, viewing angle, spacecraft position, camera identification, time at which the picture was taken, and shutter speed for each picture taken during the mission. This information supplements the information on the data block that appears with Mariner 9 pictures, which, in many cases, is grossly inaccurate. The SEDR provides a correction of that preliminary data. Figure 5 contains a sample of the SEDR and includes information for DAS 09017234. (Note that the SEDR DAS time (shutter opening) is five digits less than the picture data block DAS time (first line count); e.g., SEDR DAS 09017229 relates to all DAS 09017234 picture versions.)

## MOSAICS

Various types of mosaics are being produced by the staff at the U.S. Geological Survey (USGS), Center for Astrogeology, Flagstaff, Arizona. Some mosaics cover major portions of the planet in various stages of data refinement while others cover selected small areas. The mosaics expected include preinsertion, global coverage, geodesy, high sun, polar, and B-camera frame sequences. NSSDC will receive the mosaics on 4- by 5-in. film sheets. These sheets will be copies of the full-size mosaics compiled from MTVS enhancements. *NSSDC cannot respond to requests for mosaics at this time. An Announcement Bulletin will be distributed when these data are available.*

## JOURNAL ARTICLES

Several interpretive and analytical studies of the Mariner 9 mission and the TV experiment have been published. The following papers are recommended to the investigators of the Mariner 9 pictures. *Reprints of these papers are not available from NSSDC.*

The January 1970 issue of Icarus, 12, No. 1, contains seven special papers that describe the Mariner experiments and instrumentation. Mission objectives and anticipated results are included. Science, 175, No. 4019, January 21, 1972, contains nine technical papers on the initial results of Mariner 9. Included are analyses of the data returned from the experiments on board the spacecraft. Pub-

REV. 207		LIBSET SEDR FOR TVS										
DAS TIME	-----PIID-----	FILTER	TFP(H/MM/SS)	RMAG	SUNLAT	S/C-LAT	OLAT	PIC.HT	NORAN	SUNAN		
CAM--REV	SHUTTER TIME	EXPOSURE	LOCAL TIME	S/C TA	SUNLON	S/C-LON	OLON	PIC. WD	PIXEL SIZE	S/C-AN		
<hr/>												
9.	9.016.949	207A0922 06314	POL-60(5)	-0/02/34	5050.31	-3.94	-29.55	-29.74	321 KM	195.15	170.	
TV#A	207	56/11/15/23.34	48 MS	12.78 HRS	353.53	77.99	60.34	66.39	396 KM	.490 KM	286.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-25.62	-32.05	64.35	62.15	15.92	8.79	25.32	31.78	41.15	28.89	1707	1676	
-29.58		66.19		15.22		27.96		37.28		1703.27		
-26.80	-33.61	70.40	68.35	27.03	23.29	23.97	31.00	45.71	34.82	1793	1758	
<hr/>												
10.	9.017.019	207A1022 06315	POL-60(5)	-0/01/10	5040.75	-3.94	-26.54	-25.36	310 KM	197.66	161.	
TV#A	207	56/11/16/47.34	48 MS	13.00 HRS	357.04	78.33	58.71	63.51	397 KM	.487 KM	306.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-21.16	-27.54	61.75	59.42	18.09	3.61	23.58	29.69	41.11	28.85	1710	1655	
-25.19		63.32		13.18		25.67		37.24		1683.48		
-22.53	-29.1E	67.42	65.09	26.01	18.61	21.38	28.18	45.67	34.79	1773	1713	
<hr/>												
11.	9.017.089	207A1122 06316	POL-60(5)	+0/00/13	5038.33	-3.94	-23.45	-20.91	304 KM	199.70	150.	
TV#A	207	56/11/18/11.34	48 MS	13.19 HRS	.57	78.67	57.17	60.52	402 KM	.491 KM	328.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-16.58	-23.00	59.37	56.94	21.32	1.50	22.77	28.36	41.03	28.77	1730	1651	
-20.73		60.76		12.97		24.19		37.16		1680.10		
-18.16	-24.72	64.78	62.25	26.01	14.49	19.66	26.10	45.55	34.72	1770	1687	
<hr/>												
12.	9.017.159	207A1222 06317	POL-60(5)	+0/01/37	5043.08	-3.94	-20.34	-16.38	302 KM	210.28	138.	
TV#A	207	56/11/19/35.35	48 MS	13.37 HRS	4.08	75.01	55.72	58.56	414 KM	.501 KM	349.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-11.84	-18.42	57.13	54.63	25.27	6.61	23.04	27.89	40.90	28.64	1768	1663	
-16.19		58.40		14.64		23.66		37.04		1692.89		
-13.65	-20.24	62.40	59.70	27.01	11.30	19.05	24.88	45.47	34.62	1785	1677	
<hr/>												
13.	9.017.229	207A1322 06318	POL-60(5)	+0/03/01	5054.93	-3.94	-17.23	-11.75	305 KM	202.49	126.	
TV#A	207	56/11/20/59.35	48 MS	13.54 HRS	7.59	79.35	54.34	56.35	432 KM	.518 KM	4.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-6.92	-13.7E	55.00	52.42	29.74	11.77	24.41	28.33	40.74	28.49	1826	1691	
-11.56		56.20		17.71		24.15		36.89		1722.38		
-9.00	-15.72	60.23	57.37	28.96	9.87	19.65	24.61	45.32	34.48	1818	1684	
<hr/>												
14.	9.017.299	207A1422 06319	POL-60(5)	+0/04/25	5073.83	-3.94	-14.12	-6.87	313 KM	203.29	116.	
TV#A	207	56/11/22/23.36	48 MS	13.70 HRS	11.07	79.69	53.03	54.23	460 KM	.546 KM	14.	
LAT(X)		LON(X)		VAR(X)		SLAR(X)		PAR(X)		SRR(X)		
-1.59	-8.93	52.89	50.22	35.10	17.38	26.87	29.68	40.71	28.43	1914	1739	
-6.66		54.07		22.04		25.64		36.83		1772.58		
-4.03	-11.02	58.20	55.17	32.07	11.16	21.43	25.30	45.25	34.37	1874	1708	

Figure 5. Sample of the Supplementary Experiment Data Records

lished during October 1972 and January 1973, in Icarus, 17, No. 2, and Icarus, 18, No. 1, were 15 Mariner 9 papers, a majority of which were presented at the Madrid COSPAR meeting in May 1972. Analytical papers were also published in the January 1973 issue of Scientific American, 228, No. 1, and the February issue of National Geographic, 143, No. 2. During 1973, a number of articles that describe the results of the Mariner 9 mission will be published in the Journal of Geophysical Research.

#### "MARINER MARS 1971 TELEVISION PICTURE CATALOG," VOLUME I

The "Mariner Mars 1971 Television Picture Catalog," Volume I, one part of a four-part documentation package being produced by JPL, provides a general guide to the TV data acquired by Mariner 9. This volume presents the actual pictures obtained by the TV experiment. Pictures are presented in mosaic format or as composites wherever possible. Volume I is organized by the following discipline groups.

- . Geology and mapping
- . Geodesy
- . Polar phenomena
- . Variable surface features
- . Atmospheric phenomena
- . Satellites

Each section describes the purposes and results of the particular study. The revolutions during which particular sequences of pictures were obtained, information on individual images, and a detailed description of the computer and the film processing are also included. Volume I is expected to be available in September 1973.

#### "MARINER MARS 1971 TELEVISION PICTURE CATALOG, SEQUENCE DESIGN AND PICTURE COVERAGE," VOLUME II

The "Mariner Mars 1971 Television Picture Catalog, Sequence Design and Picture Coverage," Volume II, JPL Tech. Memo. 33-585, contains a collection of data that relates to the Mariner 9 TV pictures. The information is arranged for quick identification of operations during an entire science cycle, during an individual revolution, and during individual science links or sequences. Supporting data in Volume II are organized in the following sections.

- . Explanation of Tables, Plots, and Data
- . Operations
- . Accuracy of TV Camera Targeting

In addition, summary tables that present the nominal design for each major picture-taking cycle and the sequence actually acquired on each revolution are included. These tables permit identification of all TV sequences and the corresponding individual pictures for the first 262 revolutions of the mission. An index by each picture's latitude center point is also provided. Orthographic and/or Mercator plots for all pictures, with pertinent numerical data for their center points, are included in Volume II, as are other helpful tables and plots. From this volume a user can select individual pictures for study, but picture version desired cannot be determined. Volume II is available from NSSDC.

TV pictures that were acquired during the extended mission (after orbit 262) will be described in a supplement to Volume II of the "Mariner Mars 1971 Television Picture Catalog."

#### MM71 \*MTC/MTVS CATALOG ON MICROFICHE

The MM71 MTC/MTVS Catalog on Microfiche consists of approximately 800 cards of 105- by 148-mm microfiche that contain all the MTVS picture data available on 70-mm film. All MTVS picture versions processed for each DAS time exposure are presented side by side with one data block. These pictures are sequenced by exposure time (DAS time) on the microfiche cards, and all pictures for one revolution of Mars (generally 31 to 33 pictures were taken during each revolution) are contained on three microfiche cards, the last of which also contains a supporting data summary for the particular revolution. These supporting data summaries have been updated as of July 15, 1972, and therefore may differ from those appearing in individual data blocks. The microfiche can be ordered as a complete catalog or by individual cards to enable the requester to select the MTVS picture version best suited for his study. Figure 6 shows a sample of the microfiche card that contains the MTVS sample pictures in Figure 1.

A copy of "Mariner 9 Television Pictures: Microfiche Library User's Guide, MTC/MTVS Real-Time Pictures," JPL Tech. Memo. 33-595, will be routinely provided with all MTVS picture data products requested from NSSDC. This guide contains specific information necessary for efficient use of the microfiche, as well as information helpful to the user of any MTVS picture product.

\*Mission Test Computer.



MM'71 MTC-MTVS VIDEO ROLL 4241-2

DAS 09017234

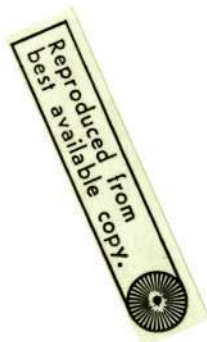
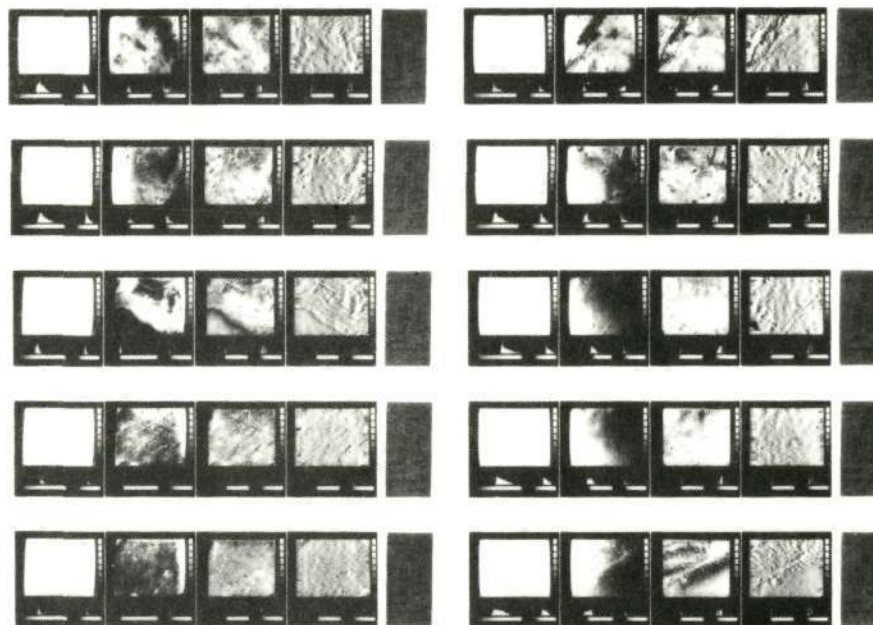


Figure 6. Sample MTC/MTVS Microfiche Card

#### MM71 IPL/RDR CATALOG ON MICROFICHE

The MM71 IPL/RDR Catalog on Microfiche will consist of approximately 600 cards of microfiche that contain all of the IPL/RDR images available on 70-mm roll film, except for the rectified and scaled versions. Plans for the organization of the IPL microfiche catalog are not final at this writing.

#### MM71 MTC/MTVS AND IPL/RDR CATALOGS ON MICROFILM

The MTC/MTVS and IPL/RDR 70-mm pictures will be reproduced on 100-ft reels of 16-mm microfilm by JPL. This microfilmed picture catalog is expected to be available during the third quarter of 1973.

# SUMMARY OF STATUS OF MARINER 9 PICTURE DATA TO BE DISTRIBUTED BY NSSDC

- . MTVS Picture Data  
(raw pictures and shading corrected, high-pass filtered, and vertical AGC enhancements)  
NSSDC can respond to requests if DAS time, roll and file numbers, and version desired are submitted by requester.
- . IPL Picture Data  
(RDR versions are contrast enhanced, high-pass filtered, and rectified and scaled)  
NSSDC is receiving IPL picture data on a continuing basis. Due to the volume of data being processed and the nonsequential manner in which they are received, NSSDC is not prepared to respond immediately to requests at this time. However, requests will be filled as soon as possible.
- . Indexes to Mariner 9 TV Picture Data  
NSSDC can respond to requests for one 16-mm reel of microfilm containing the indexes by Latitude Center Point, Longitude Center Point, and Comments and one 16-mm reel of microfilm containing the indexes by DAS Time, MTVS Roll and File Number, and IPL Roll and Processing Time.
- . SEDR (Supplementary Experiment Data Records)  
NSSDC will supply the complete record on one 16-mm reel of black and white microfilm with each initial request for picture data.
- . Mosaics  
Until the mosaics are received, NSSDC cannot respond to requests. An Announcement Bulletin will be distributed when these data are available.
- . Mariner Mars 1971 Television Picture Catalog, Volume I  
Until the completed documentation is received, NSSDC cannot respond to requests.
- . Mariner Mars 1971 Television Picture Catalog, Volume II  
The documentation is currently available; NSSDC can respond to requests.
- . MM71 MTC/MTVS Catalog on Microfiche  
The complete catalog is currently available; NSSDC can respond to requests.
- . MM71 IPL/RDR Catalog on Microfiche  
Until a complete catalog is received, NSSDC cannot respond to requests.
- . MM71 MTC/MTVS and IPL/RDR Catalogs on Microfilm  
Until the microfilm reels are received, NSSDC cannot respond to requests.

## ORDERING PROCEDURES

It is felt that when planning to order Mariner 9 pictures from NSSDC, the requester will find the Latitude, Longitude, and Comments indexes and Volume II of the "Mariner Mars 1971 Television Picture Catalog" to be most useful. The user may then want to order microfiche copies of the pictures before making a final selection of picture data required.

NOTE: The DAS time and version desired are to be included for each picture requested, as well as the roll and file numbers (MTVS) or roll and processing time (IPL).

The Mariner 9 TV data order form enclosed with this Bulletin is provided for the requester's convenience. All parts of the form must be completed to ensure satisfactory request fulfillment. All required items should be identified in a single order to expedite the processing of the request. A copy of the "Charge and Service Policy" for dissemination of data from the National Space Science Data Center is included for the requester's guidance.

NSSDC requires knowledge of the scientific use to which the data provided are being put; therefore, a statement to this effect should be included in each request. NSSDC would also appreciate receiving copies of all publications resulting from studies in which data supplied by NSSDC have been used. It is further requested that NSSDC be acknowledged as the source of the data in all publications resulting from use of the data provided.

Requesters may view the Mariner 9 pictures at NSSDC. Inquiries about or requests for pictures from U.S. scientists should be addressed to:

National Space Science Data Center  
Code 601.4  
Goddard Space Flight Center  
Greenbelt, Maryland 20771  
Telephone: (301) 982-6695

Requests from researchers outside the U.S.A. should be directed to:

World Data Center A for Rockets and Satellites  
Code 601  
Goddard Space Flight Center  
Greenbelt, Maryland 20771, U.S.A.

## NATIONAL SPACE SCIENCE DATA CENTER

### Charge and Service Policy

The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science flight experiments in support of additional studies beyond those performed by the principal investigators. Therefore, NSSDC will provide data and information upon request to any individual or organization resident in the United States. In addition, the same services are available to scientists outside the United States through the World Data Center A (WDC-A) for Rockets and Satellites. Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The requester will be notified of the cost, and payment must be received prior to processing the request. However, the Director of NSSDC may waive, as resources permit, the charge for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with:

- . NASA installations, NASA contractors, or NASA grantees
- . Other U.S. Government agencies, their contractors, or their grantees
- . Universities or colleges
- . State and local governments
- . Nonprofit organizations

## MARINER 9 TV DATA PRICE LIST

### PICTURE INDEXES

One 16-mm microfilm reel containing three indexes sorted  
by Latitude, Longitude, and Comments..... \$ 4.15

One 16-mm microfilm reel containing three indexes sorted  
by MTVS Roll and File Number, DAS Time and Revolution,  
and IPL Roll and Processing Time ..... 4.15

### PICTURE CATALOGS

Mariner Mars 1971 Television Picture Catalog, Vol. I  
(available September 1973)  
Printed Copy..... \$ 10.00  
16-mm Microfilm Reel Copy..... 4.15

Mariner Mars 1971 Television Picture Catalog, Sequence  
Design and Picture Coverage, Vol. II, JPL Tech.  
Memo. 33-585  
Printed Copy..... 10.00  
16-mm Microfilm Reel Copy..... 4.15

Complete MM71 MTC/MTVS Catalog on Microfiche..... 180.00

Complete MM71 IPL/RDR Catalog on Microfiche  
(available July 1973)..... 120.00

Complete MM71 MTC/MTVS and IPL/RDR Catalogs on  
16-mm Microfilm Reels..... 75.00  
to  
100.00\*

### TYPICAL PER ITEM COSTS

FORM	SIZE	COST	FORM	SIZE	COST
PRINTS	8 x 10 in.	0.70	FILM DUPLICATES	4 x 5 in.	\$0.70
	11 x 14 in.	0.75	MICROFICHE	4 x 6 in.	0.25
	16 x 20 in.	2.00		2 x 2 in.	0.90
	20 x 24 in.	3.00	SLIDES	3.25 x 4 in.	1.75

Prices for reproduction services other than those listed will be quoted upon request. All prices are subject to change without notice.

\*Estimated cost. Total number of reels not known at this time. Price will be approximately \$5.00 per reel.



## MARINER 9 ORDER FORM

<b>Scientists OUTSIDE the United States send order to:</b>  WORLD DATA CENTER A ROCKETS AND SATELLITES CODE 601 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771, USA	<b>Scientists WITHIN the United States send order to:</b>  NATIONAL SPACE SCIENCE DATA CENTER CODE 601.4 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771, USA
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### REQUESTER INFORMATION (Please print)

NAME AND TITLE		POSITION	
DIVISION/BRANCH			MAIL CODE
ORGANIZATION			
ADDRESS			
CITY		STATE	
ZIP CODE OR COUNTRY	TELEPHONE	(Area Code)	(Number) (Extension)
DATE OF REQUEST	DATE DATA DESIRED <small>(Our average processing time for a request is 3 to 4 weeks. Please allow ample time for delivery. We will notify you if we cannot meet the date specified.)</small>		

### INTENDED USE OF PHOTOGRAPHS (check all that apply)

<input type="checkbox"/> Support of a NASA effort (project, study, etc.); Contract No. _____ <input type="checkbox"/> Support of a U.S. Government effort (other than NASA) <input type="checkbox"/> Research and analysis project (individual or company sponsored) <input type="checkbox"/> Educational purposes (explain below) <input type="checkbox"/> Preparation of Master's thesis <input type="checkbox"/> Preparation of Doctoral thesis <input type="checkbox"/> Other: _____	<input type="checkbox"/> Exhibit or display <input type="checkbox"/> Reference material <input type="checkbox"/> Use in publication
Please state briefly the research project(s) in which you are engaged and if you plan to prepare any articles for publication. If so, please acknowledge NSSDC as the source of the photographs and send us a copy of your publication for our record.  _____ _____ _____	

### NSSDC CHARGE AND SERVICE POLICY

<p>The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science flight experiments in support of additional studies beyond those performed by the principal investigators. Therefore, NSSDC will provide data and information upon request to any individual or organization resident in the United States. In addition, the same services are available to scientists outside the United States through the World Data Center A (WDC-A) for Rockets and Satellites. (The addresses for both NSSDC and WDC-A are given above.) Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The requester will be notified of the cost, and payment must be received prior to processing the request. However, the Director of NSSDC may waive, as resources permit, the charge for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with: (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state and local governments; and (5) nonprofit organizations.</p>
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# DATA REQUESTED

# VERSIONS AVAILABLE

PICTURE INDEXES (16-MM MICROFILM REELS)	PICTURE CATALOGS	MTVS	IPL
<input type="checkbox"/> INDEXES SORTED BY: <ul style="list-style-type: none"> <li>• LATITUDE CENTER POINT</li> <li>• LONGITUDE CENTER POINT</li> <li>• COMMENTS</li> </ul> <input type="checkbox"/> INDEXES SORTED BY: <ul style="list-style-type: none"> <li>• MTVS ROLL AND FILE NUMBER</li> <li>• DAS TIME AND REVOLUTION</li> <li>• IPL ROLL AND PROCESSING TIME</li> </ul>	MARINER MARS 1971 TELEVISION PICTURE CATALOG VOL. I (AVAILABLE SEPT. 1973) <input type="checkbox"/> PRINTED COPY <input type="checkbox"/> 16-MM MICROFILM REEL COPY MARINER MARS 1971 TELEVISION PICTURE CATALOG, SEQUENCE DESIGN AND PICTURE COVERAGE, VOL. II, JPL TECH. MEMO. 33-585 <input type="checkbox"/> PRINTED COPY <input type="checkbox"/> 16-MM MICROFILM REEL COPY <input type="checkbox"/> COMPLETE MM71 MTC/MTVS CATALOG ON MICROFICHE <input type="checkbox"/> COMPLETE MM71 IPL/RDR CATALOG ON MICROFICHE (AVAILABLE JULY 1973) <input type="checkbox"/> INDIVIDUAL MICROFICHE OF SELECTED FRAMES (IDENTIFY & ORDER BELOW) <input type="checkbox"/> COMPLETE MM71 MTC/MTVS AND IPL/RDR CATALOG ON 16-MM MICROFILM REELS <input type="checkbox"/> INDIVIDUAL 16-MM REELS THAT INCLUDE SELECTED FRAMES (IDENTIFY & ORDER BELOW)	<ul style="list-style-type: none"> <li>• RAW</li> <li>• SHADING CORRECTED (SC)</li> <li>• VERTICLE AGC (VAGC)</li> <li>• HIGH-PASS FILTERED (HPF)</li> </ul>	<ul style="list-style-type: none"> <li>• CONTRAST ENHANCED (ASTRTCH)</li> <li>• HIGH-PASS FILTERED (FASTFIL)</li> <li>• RECTIFIED &amp; SCALED (R&amp;S)</li> </ul>

# INDIVIDUAL FRAME IDENTIFICATION

DAS TIME	VERSION	MTVS ROLL AND FILE NUMBER	IPL ROLL AND PROCESSING TIME	FORM*	SIZE**	ADDITIONAL SPECIFICATIONS

\*Paper print, negative or positive film duplicates, microfiche.

\*\*NSSDC nominally processes picture enlargements to include both the image area and the data block as shown in Figures 1 and 3 of NSSDC 73-03. Upon special request, pictures will be enlarged to exclude the data block, resulting in an approximately 40% increase in the size of the image area. Indicate under "Additional Specifications" if data block should be excluded.

## MARINER 9 ORDER FORM (continued)

## INDIVIDUAL FRAME IDENTIFICATION

[illegible]

\*Paper print, negative or positive film duplicates, microfiche.

\*\*NSSDC nominally processes picture enlargements to include both the image area and the data block as shown in Figures 1 and 3 of NSSDC 73-03. Upon special request, pictures will be enlarged to exclude the data block, resulting in an approximately 40% increase in the size of the image area. Indicate under "Additional Specifications" if data block should be excluded.

24

[illegible]

Upon special request, pictures will be enlarged to exclude the data block, resulting in an approximately 40% increase in the size of the image area. Indicate under "Additional Specifications" if data block should be excluded.

\* U.S. GOVERNMENT PRINTING OFFICE: 1972-735-968/668